

Amendment and Response

Applicant: Craig K. Carlson-Stevermer

Serial No.: 10/622,849

Filed: July 18, 2003

Docket No.: A126.114.102

Title: WAFER STAGING PLATFORM FOR A WAFER INSPECTION SYSTEM

REMARKS

These Remarks are responsive to the Non-Final Office Action mailed May 3, 2006. In that Office Action, the Examiner withdrew the finality of the Office Action mailed on February 14, 2006, which is noted with appreciation.

In the Office Action mailed May 3, 2006, claims 1, 5-11, and 16-24 were rejected under 35 U.S.C. § 102(e) as anticipated by Yamazaki, U.S. Publication No. 2002/0011835 ("Yamazaki"). In addition, claims 12-14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Yamazaki in view of Smith et al., U.S. Patent No. 6,503,043 ("Smith").

With this Response, claims 1 and 23 have been amended. Claims 1, 5-14, and 16-24 remain pending in the application and are presented for consideration and allowance.

35 U.S.C. § 102 Rejections

Claims 1, 5-11, and 16-24 were rejected under 35 U.S.C. § 102(e) as anticipated by Yamazaki.

Yamazaki teaches semiconductor wafer test equipment 1 that includes a frame 2 and a plate 3 that bisects the frame 2 into a vacuum chamber 4 and a machine room 1a. The machine room 1a houses a refrigerator 8 and a vacuum pump 9 that communicate with the vacuum chamber 4. The vacuum chamber 4 includes a floor formed by the plate 3, a wafer stage 14 extending from the plate 3, and legs 13 extending from the wafer stage 14 that connect to a wafer holder 4a. In this regard, an imager 10 (a camera) is disposed along a ceiling of the vacuum chamber 4 above the wafer holder 4a, and a test prober 5 having a probe card 51 is positioned between the imager 10 and the wafer holder 4a.

Yamazaki teaches in paragraph 0027 that the vacuum chamber 4 includes a valve 30 that can be opened to pass wafers into a spare chamber 20. Yamazaki teaches in paragraph 0040 that the spare chamber 20 includes a cassette stage 21 for holding semiconductor wafers W, a pre-alignment unit 22, and a robot arm 23.

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In rejecting independent claim 1, the Office Action mailed May 3, 2006 takes the position at page 2 that Yamazaki teaches that chamber 20 is a first vacuum assisted platform, and that wafer holder 4a is a second vacuum assisted platform. Applicant respectfully disagrees.

Yamazaki teaches at paragraph 0039 that both the spare chamber 20 and the vacuum chamber 4 are maintained under vacuum to ensure that the wafers are subjected to an intended test that includes maintaining a cooled wafer W in an evacuated atmosphere. In this regard, since the vacuum chamber 4 and the spare chamber 20 are both maintained under similar (if not identical) vacuum conditions, then the wafer holder 4a (inside the vacuum chamber 4) and the spare chamber 20 must be at the same relative pressure. Consequently, since the relative pressure difference between the wafer holder 4a and the vacuum chamber 4 is zero, and since the relative pressure difference between the vacuum chamber 4 and the spare chamber 20 is zero, neither of the wafer holder 4a nor the spare chamber 20 can be a "vacuum-assisted" platform. That is to say, the local pressure around the wafer holder 4a and the vacuum chamber 4 is uniform, such that the wafer W is not held in place by a vacuum-assisted pressure difference.

With this in mind, independent claim 1 has been amended to provide a wafer staging platform that includes a first and second vacuum-assisted platforms for holding wafers, with the first and second vacuum-assisted platforms being arranged one above the other. The wafer holder 4a and the chamber 20 taught in Yamazaki fail to provide a vacuum-assisted platform for holding a wafer; further, the wafer holder 4a and the chamber 20 are not arranged one above the other. For at least these reasons, it is respectfully submitted that amended claim 1 is allowable over Yamazaki.

With regard to independent claim 5, the Office Action takes the position at page 3 that Yamazaki teaches at least two wafer loadports in the form of cassette stage 21 and wafer holder 4a, and a wafer staging platform in the form of wafer stage 14. Applicant respectfully disagrees. In fact, Yamazaki teaches at paragraph 0043 that wafer holder 4a is merely a cooling platform that holds a wafer W for contact with probe needles 52

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of the prober 5. Thus, the wafer holder 4a of Yamazaki would not be viewed by one of skill in the art as a wafer loadport configured to receive a wafer transportation cassette. The wafer holder 4a receives, and facilitates testing thereon, of a single wafer, not a wafer transportation cassette. Consequently, Yamazaki fails to teach or suggest at least two wafer loadports, where each wafer loadport is configured to receive a wafer transportation cassette, as required by independent claim 5.

Moreover, the Office Action takes the position at page 3 that the wafer stage 14 is a wafer staging platform. However, independent claim 5 requires that the wafer staging platform be disposed closer to a wafer processing platform than any of the wafer loadports. Since the Office Action interprets wafer holder 4a to be a wafer loadport, and since wafer holder 4a is positioned **between** wafer stage 14 (purported to be a wafer staging platform) and the imager 10 (purported to be a wafer processing platform), then Yamazaki fails to teach or suggest a wafer staging platform that is disposed closer to the wafer processing platform than any of the wafer loadports, as required by independent claim 5.

For the above reasons, it is respectfully submitted that independent claim 5, and the claims depending from independent claim 5, recite patentable subject matter that is not taught or suggested by Yamazaki.

With regard to independent claim 23, the Office Action takes the position at page 4 that the camera 10 of Yamazaki is a sample processing platform, and that robot arm 23 stages a first wafer sample W on wafer holder 4a.

First, it is respectfully submitted that the camera 10 of Yamazaki is not a "sample processing platform" as required by claim 23. For example, independent claim 23 requires processing a first sample on the sample processing platform. In contrast, the imaging camera 10 of Yamazaki is positioned above the wafer W sample, such that operation of the Yamazaki camera 10 fails to teach or suggest processing a sample on a sample platform, as required by amended independent claim 23.

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In addition, with this Response independent claim 23 has been amended to provide staging a first sample on a sample holder such that a sample processing platform is available for processing second sample.

The Examiner interprets sample holder 4a to provide a sample holder that is configured to stage a first sample. However, Yamazaki contradicts this interpretation in paragraph 0043 where it is taught that the wafer W is supported on the wafer holder 4a while being cooled and subjected to an intended test (such as being contacted by probe needles 52). Thus, the wafer holder 4a is a test area for the wafer, and the wafer must be moved off the wafer holder 4a to make room to test a next wafer. For at least this reason, Yamazaki fails to teach or suggest staging a first sample on a sample holder such that the sample processing platform is available for processing a next sample, as required by amended independent claim 23. Thus, it is respectfully submitted that amended independent claim 23, and claim 24 that depends from claim 23, recite patentable subject matter that is not taught or suggested by Yamazaki.

For the reasons above, it is respectfully requested that the rejections to claims 1, 5-11 and 16-24 under 35 U.S.C. § 102(e) as anticipated by Yamazaki be withdrawn.

35 U.S.C. § 103 Rejections

Claims 12-14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Yamazaki in view of Smith.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify or combine the reference teachings. Second, there must exist a reasonable expectation of success. Third, the references must teach or suggest all of the claim limitations. MPEP § 2143.

However, the *prima facie* case of obviousness cannot be established if the references employed are not in the inventor's field of endeavor, or reasonably pertinent to the specific problem with which the inventor was involved. *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986).

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Smith is Non-analogous Art.

References within the statutory terms of 35 U.S.C. § 103 qualify as prior art for an obviousness determination only when analogous to the claimed invention. *In re Clay*, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). Two factors define whether a reference is analogous art: (1) when the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313 (Fed. Cir. 1986).

A. Smith is not from the Same Field of Endeavor.

Substantial evidence must support the PTO's factual assessment of the field of endeavor. *In re Bigio*, 381 F.3d 1320, 1326, 72 USPQ2d 1209 (Fed. Cir. 2004) (citing *In re Gartside*, 203 F.3d 1305, 1315 (Fed. Cir. 2000)). Quoting Judge Rader: "In other words, the PTO must show adequate support for its findings on the scope of the field of endeavor in the applicant's written description and claims, including the structure and function of the invention." 381 F.3d at 1326.

Regarding the inventor's field of endeavor, the Federal Circuit offers this reminder:

We have reminded ourselves and the PTO that it is necessary to consider "the reality of the circumstances"-in other words, common sense- in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.

In re Oetiker at 1446 (quoting *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (C.C.P.A. 1979)).

Smith teaches a multi-level loading apparatus useful for transporting and loading articles, such as water bottles illustrated in FIGS. 2-3, into racks. It is respectfully submitted that the field of endeavor of Smith is more closely identified as the handling, the transportation, and the storage of water bottles, boxes, crates and the like (See

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Smith at column 7, lines 48-61). For this reason alone, it is believed that Smith is not from the wafer staging field of endeavor.

In addition, it is believed that no substantial evidence has been offered by the Office to support a factual assessment of Smith's field of endeavor, as required by the Federal Circuit. Specifically, it is believed that the Office Action does not show support for any of its findings on the scope of Smith's field of endeavor as based upon Applicant's written description and claims. Moreover, it is believed that common sense dictates that a person of ordinary skill in the wafer staging art would not reasonably be expected to look for wafer staging solutions in the water bottle and level loading apparatus taught by Smith. For all of the above reasons, it is respectfully submitted that Smith is not from the wafer staging field of endeavor.

B. Smith is Directed to a Different Purpose, and therefore, not Reasonably Pertinent to the Particular Problem of Wafer Staging.

"A reference is reasonably pertinent if . . . it is one which, because of the matter with which it deals, logically would have commended itself to the inventor's attention in considering his problem . . . If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem . . . If is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it." *In re Clay*, 966 F.2d 656, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992).

The Office Action takes the position at page 5 and page 6 that Smith teaches a sensor 192 disposed on a staging platform 182. The Office Action concedes that Yamazaki does not disclose a sensor. The Office Action concludes that it would have been obvious to a person of ordinary skill in the art to modify the admitted prior art in view of Summer (which is interpreted to be a typographical error in light of the rejections under Yamazaki in view of Smith) by providing the sensor taught in Smith to the apparatus taught in Yamazaki. Applicant respectfully disagrees.

The sensor 192 taught in Smith is a level sensor 192 that detects a vertical height of the staging platform as it moves vertically to fill racks 110 (See FIG. 6). It is

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respectfully submitted that Smith is simply directed to a different purpose (i.e., detecting a vertical height of a staging platform 182) such that an inventor involved in wafer staging would have no motivation or occasion to consider the sensor 192 taught in Smith.

Based upon the two-part analysis above, it is respectfully submitted that a *prima facie* case of obviousness cannot be established since Smith is not in the inventor's field of endeavor, nor reasonably pertinent to the specific problem with which the inventor was involved. Thus, it is respectfully requested that the rejections to claims 12-14 under 35 U.S.C. § 103(a) as unpatentable over Yamazaki in view of Smith be withdrawn.

The Cited References, Even If Combined, Fail to Establish a *Prima Facie* Case of Obviousness.

It is respectfully submitted that one of skill in the art of handling semiconductor wafers would have not motivation to combine the test equipment of Yamazaki with the loading apparatus and level sensor of Smith. For example, Yamazaki teaches in paragraph 0041 that wafers W are pre-aligned one-by-one, and then passed one at a time to the wafer holder 4a (extending from wafer stage 14 that is purported to be a staging platform). In contrast, Smith teaches at column 7, lines 1-6 that two conditions are required to be met before the controller acts: 1) the sensor 192 must detect that the staging platform is at the prescribed level; and 2) that a full array 11 of articles 10 must be present on the staging platform 182 and on the conveyor belt 152. It is believed that one of skill in the art would have no motivation to apply the required sensor conditions (level height and a full array of articles) to the one-by-one process employed by the test equipment of Yamazaki. For this reason alone, it is believed that a *prima facie* case of obviousness cannot be established based on these references.

However, even if combined, the cited references, alone or in combination, fail to teach or suggest all of the limitations of claims 12-14. Claims 12-14 depend from independent claim 5, which requires: at least two wafer loadports, where each wafer loadport is configured to receive a wafer transportation cassette; and a wafer staging

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platform that is disposed closer to a wafer processing platform than any of the wafer loadports. As noted above, neither of the cited references teach or suggest at least two wafer loadports, where each wafer loadport is configured to receive a wafer transportation cassette; and the cited references fail to teach or suggest a wafer staging platform that is disposed closer to a wafer processing platform than any of the wafer loadports. Consequently, since the cited references fail to teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be established.

For all of the above reasons, it is respectfully requested that the rejections to claims 12-14 under 35 U.S.C. § 103(a) as unpatentable over Yamazaki in view of Smith be withdrawn.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1, 5-14, and 16-24 recite patentable subject matter, are in form for allowance, and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1, 5-14, and 16-24 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to telephone the Applicant's representative at the below-listed number to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed Timothy A. Czaja at Telephone No. (612) 573-2004, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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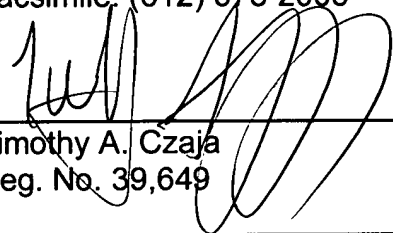
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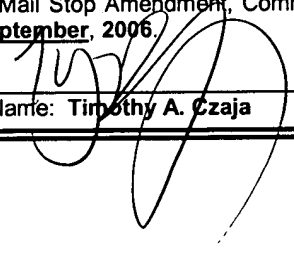
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CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5th day of September, 2006.

By: 
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